

## AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

CONTRACT ID CODE  
D0-C9(J)PAGE OF PAGES  
1 13

2. AMENDMENT/MODIFICATION NO. P00007	3. EFFECTIVE DATE SEE BLOCK 18C	4. REQUISITION/PURCHASE REG. NO. 04PR04938-02	5. PROJECT NO. (if applicable) N.A.
6. ISSUED BY CODE	N00014	7. ADMINISTERED BY (if other than item 6) SCD-C	CODE S1103A

OFFICE OF NAVAL RESEARCH  
ONR 0251: Cynthia Wagoner (703)696-2592  
E-mail wagoner@onr.navy.mil  
BALLSTON CENTRE TOWER ONE  
800 NORTH QUINCY STREET  
ARLINGTON, VA 22217-5680

DCM ATLANTA  
805 WALKER STREET, SUITE 1  
MARIETTA, GA 30060-2789

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

CREE INC  
4600 SILICON DRIVE  
DURHAM, NC 27703

**ORIGINAL**

CODE  
0C9J8

FACILITY CODE

(✓)	9A. AMENDMENT OF SOLICITATION NO. N.A.
<input type="checkbox"/>	9B. DATED (SEE ITEM 11)
<input type="checkbox"/>	10A. MODIFICATION OF CONTRACT/ORDER NO. N00014-02-C-0302
	10B. DATED (SEE ITEM 13) 28 JUN 2002

## 11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☐ The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of Offers ☐ is extended ☐ is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing items 8 and 15, and returning copies of the amendment; (b) By acknowledging receipt of the amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (if required)

SEE THE ATTACHED FINANCIAL ACCOUNTING DATA (FAD) SHEET(S)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS  
IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED ITEM 14.

(✓)	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO (Specify Authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
<input type="checkbox"/>	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation data, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
<input type="checkbox"/>	C. SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF: AUTHORITY FOR OTHER THAN FULL AND OPEN COMPETITION:
<input checked="" type="checkbox"/>	D. OTHER (Specify type of modification and authority) Bilateral Modification and Mutual Agreement between the parties.

E. IMPORTANT: Contractor ☐ is not, ☒ is required to sign this document and return 2 copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

The purpose of this modification is revise the, Supplies or Services and Price/Cost to expand the option effort (CLIN 0004) by \$799,639.00, revise Block 15G, Total Amount of Contract (Standard Form 26), update Section I, Contract Clauses, revise Section J, List of Attachments, revise Section K, Representations, Certifications and Other Statements of Offeror, and provide funding (\$799,639.00) to fully fund the CLIN 0004 under Contract Number N00014-02-C-0302. Accordingly, the funding cited on the attached Financial Accounting Data Sheet is made available.

Except as provided herein, all terms and conditions of the document referenced in item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER (Type or print) <b>SHARON M. HANNIGAN</b> CONTRACTS MANAGER	16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print) <b>VERA M. CARROLL</b> CONTRACTING OFFICER
15C. DATE SIGNED 6/30/04	16B. UNITED STATES OF AMERICA BY <b>(b) (6)</b> (S)
	16C. DATE SIGNED JUN 30 2004

SN 7540-01-152-8070  
PREVIOUS EDITION UNUSABLE  
NAVOCNR OVERPRINT (3-88)

30-105

STANDARD FORM 30 (REV. 10-83)  
Prescribed by GSA  
FAR (48 CFR) 53.243

Effective as of the date of this modification:

1) Section B, Supplies or Services and Prices/Costs is hereby revised to reflect an increase of \$799,639.00.

BASE EFFORT				
ITEM NO.	SUPPLIES/SERVICES	ESTIMATED GOVERNMENT COST SHARE	ESTIMATED CONTRACTOR COST SHARE	TOTAL ESTIMATED COST
0001	The Contractor shall furnish the necessary personnel and facilities to conduct the research effort as described in Section C.1. and C.2.	\$5,655,154.00	\$2,453,304.00*	\$8,108,458.00
	000101 ACRN AA: \$3,537,661.00			
	000102 ACRN AB: \$2,117,493.00			
0002	Deliverables for Quarters 1-6 in accordance with Attachment Number 2.			NSP
0003	Reports and Data in accordance with Exhibit A (DD Form 1423)			NSP

\*Note: \$270,947.00 out of the estimated contractor's share amount of \$2,453,304.00 represents a 50% discount on the projected price of the SiC Wafers. The SiC Wafers shall be used in support of this contract and charged at the current catalog price at the time of consumption less a %50% discount. Therefore, these items are not subject to DCAA incurred cost audit.

OPTION EFFORT				
ITEM NO.	SUPPLIES/SERVICES	ESTIMATED GOVERNMENT COST SHARE	ESTIMATED CONTRACTOR COST SHARE	TOTAL ESTIMATED COST
0004	The Contractor shall furnish the necessary personnel and facilities to conduct the research effort as described in Section C.1. and C.3.	\$2,688,742.00	\$762,833.00	\$3,451,575.00
	000401 ACRN AC: \$2,688,742.00			
0005	Deliverables for Quarters 7-8 in accordance with Attachment Number 2.			NSP
0006	Reports and Data in accordance with Exhibit A (DD Form 1423)			NSP
TOTAL ESTIMATED CONTRACT CONSIDERATION:		\$8,343,896.00	\$3,216,137.00	\$11,560,033.00

- 2) Block 15G, Total Amount of Contract, is revised to read as follows:

"Total Contract Amount: \$11,560,033.00"

- 3) Section C, Description/Specifications/Work Statement, paragraph 3, is hereby revised as follows:

"4. The Contractor shall conduct the option research effort under CLIN 0004 in accordance with the optional tasks described on pages 3-4 of Attachment Number 1, entitled "3.A. Statement of Work Optional 6 months", and Addendum Number 1 to the Statement of Work, attached to this modification and hereby made part of the contract. The contractor shall provide the deliverables described under "Quarters 7-8" of Attachment Number 2 of the contract and under "Deliverables" of the Addendum Number 1. "

- 4) Section F, Deliveries or Performance, is hereby revised as follows:

"2. The research performed under CLIN 0004 shall be conducted during the period from 23 December 2003 through 22 December 2004. A final report will be prepared, submitted, reproduced and distributed by sixty days thereafter unless the contract is extended, in which case, the final report will be prepared in accordance with the terms of such extension."

a. Item 0006 of Section B (Reports and Data) shall be delivered within the time periods stated in Exhibit A, F.O.B Destination."

- 5) Section G- Contract Administration Data, paragraph 5 entitled, "Allotment of Funds", is hereby reinstated as follows:

"5. Allotment of Funds

It is hereby understood and agreed that this contract will not exceed a total amount of \$11,560,033.00; including an estimated cost of \$8,343,896.00 and the Contractor's cost share of \$3,216,137.00.

The Base effort has been fully funded in the amount of \$5,655,154.00 (Government Share).

It is hereby understood and agreed that this contract option will not exceed a total amount of \$3,451,575.00 including an estimated cost of \$2,688,742.00 and the Contractor's cost share of \$762,833.00.

The Option Effort has been fully funded in the amount of \$2,688,742.00 (Government Share).

- 6) The funds available for performance of this contract are increased by the amount set forth on the attached Financial Accounting Data sheet.

7) Section I, contract Clauses, is hereby deleted in its entirety and replaced with the following:

Introduction: Section I

Attention: Prime Contractors. If a sub-award is made to an educational institution, Prime Contractors are directed to please refer to the ONR Model Award for appropriate flow-down clauses to universities. See <http://www.onr.navy.mil>, click Contracts & Grants Icon. Click Model Awards Link. Click Section I clauses that flow-down to University subcontractors.

## SECTION I - CONTRACT CLAUSES

(26 MAY 2004)

### COST SHARE

#### (A) FAR 52.252-02 CLAUSES INCORPORATED BY REFERENCE (FEB 1998)

This contract incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at these addresses:

<http://www.arnet.gov/far/>

[http://farsite.hill.af.mil/farsite\\_script.html](http://farsite.hill.af.mil/farsite_script.html)

For instance, a dollar threshold may trigger the applicability of the clause or a certain condition of the research may trigger the applicability of the clause. In order to provide some assistance, as to when a dollar threshold triggers a clause, we have associated certain symbols with dollar thresholds. The symbols and their appropriate dollar thresholds are as follows:

- \* Applies when contract action exceeds \$10,000
- \*\* Applies when contract action exceeds \$100,000
- + Applies when contract action exceeds \$500,000
- ++ Applies when contract action exceeds \$500,000 and subcontracting possibilities exist. Small Business Exempt.
- x (DD 250)
- xx Not applicable

#### I. FEDERAL ACQUISITION REGULATION (FAR) (48 CFR CHAPTER 1) CLAUSES:

**	FAR 52.202-1	Definitions (DEC 2001)
**	FAR 52.203-3	Gratuities (APR 1984)
**	FAR 52.203-5	Covenant Against Contingent Fees (APR 1984)
**	FAR 52.203-6	Restrictions on Subcontractor Sales to the Government (JUL 1995)
**	FAR 52.203-7	Anti-Kickback Procedures (JUL 1995)
**	FAR 52.203-8	Cancellation, Rescission, and Recovery of Funds for Illegal or Improper Activity (JAN 1997)
**	FAR 52.203-10	Price or Fee Adjustment for Illegal or Improper Activity (JAN 1997)
**	FAR 52.203-12	Limitation on Payments to Influence Certain Federal Transactions (JUN 2003)
**	FAR 52.204-4	Printing/Copying Double-Sided on Recycled Paper (AUG 2000)
	FAR 52.204-7	Central Contractor Registration (OCT 2003)
	FAR 52.211-15	Defense Priority and Allocation Requirements (SEP 1990)
**	FAR 52.215-2	Audit and Records - Negotiation (JUN 1999) and Alternate II (APR 1998) (Alternate II is only applicable with cost reimbursement contracts with State and local Governments, educational institutions, and other non-profit organizations.)

	FAR 52.215-8	Order of Precedence - Uniform Contract Format (OCT 1997)
+	FAR 52.215-10	Price Reduction for the Defective Cost or Pricing Data (OCT 1997) (The clause is applicable to subcontracts over \$550,000.)
+	FAR 52.215-12	Subcontractor Cost or Pricing Data (OCT 1997) (Applicable to subcontracts over \$550,000 only)
**	FAR 52.215-14	Integrity of Unit Prices (OCT 1997) and Alternate I (OCT 1997) (Alternate I is applicable if the action is contracted under Other Than Full and Open Competition)
+	FAR 52.215-15	Pension Adjustments and Asset Reversions (DEC 1998)
+	FAR 52.215-18	Reversion or Adjustment of Plans for Postretirement Benefits (PRB) Other than Pensions (OCT 1997)
+	FAR 52.215-19	Notification of Ownership Changes (OCT 1997) (Applicable when Cost or Pricing Data is required)
	FAR 52.216-7	Allowable Cost and Payment (DEC 2002)
	FAR 52.216-8	Fixed Fee (MAR 1997)
**	FAR 52.219-4	Notice of Price Evaluation Preference for HUBzone Small Business Concerns (JAN 1999)
**	FAR 52.219-8	Utilization of Small Business Concerns (MAY 2004)
++	FAR 52.219-9	Small Business Subcontracting Plan (JAN 2002)
++	FAR 52.219-16	Liquidated Damages - Subcontracting Plan (JAN 1999)
	FAR 52.222-1	Notice to the Government of Labor Disputes (FEB 1997)
**	FAR 52.222-2	Payment for Overtime Premiums (JUL 1990) (Note: The word "zero" is inserted in the blank space indicated by an asterisk)
	FAR 52.222-3	Convict Labor (JUN 2003) (Reserved when FAR 52.222-20 Walsh Healy Public Contracts Act is applicable)
**	FAR 52.222-4	Contract Work Hours and Safety Standards Act - Overtime Compensation (SEP 2000)
	FAR 52.222-21	Prohibition of Segregated Facilities (FEB 1999)
	FAR 52.222-26	Equal Opportunity (APR 2002)
*	FAR 52.222-35	Equal Opportunity for Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (DEC 2001)
*	FAR 52.222-36	Affirmative Action for Workers with Disabilities (JUN 1998)
*	FAR 52.222-37	Employment Reports on Special Disabled Veterans, Veterans of the Vietnam Era, and Other Eligible Veterans (DEC 2001)
**	FAR 52.223-14	Toxic Chemical Release Reporting (AUG 2003)
	FAR 52.225-13	Restrictions on Certain Foreign Purchases (DEC 2003)
**	FAR 52.227-1	Authorization and Consent (JUL 1995)
**	FAR 52.227-2	Notice and Assistance Regarding Patent and Copyright Infringement (AUG 1996)

	FAR 52.228-7	Insurance Liability to Third Persons (MAR 1996) (Further to paragraph (a)(3), unless otherwise stated in this contract, types and limits of insurance required are as stated in FAR 28.307-2)
	FAR 52.232-9	Limitation on Withholding of Payments (APR 1984)
**	FAR 52.232-17	Interest (JUN 1996)
	FAR 52.232-23	Assignment of Claims (JAN 1986) and Alternate I (APR 1984)
	FAR 52.232-25	Prompt Payment (OCT 2003) and Alternate I (FEB 2002) (The words "the 30 <sup>th</sup> day" are inserted in lieu of "the 7 <sup>th</sup> day" at (a) (5) (i). [When Alternate I is applicable (a)(5)(i) does not apply] <b>[Alternate I applies when awarding a cost reimbursement contract for services]</b>
	FAR 52.232-33	Payment by Electronic Funds Transfer - Central Contractor Registration (OCT 2003)
	FAR 52.233-1	Disputes (JULY 2002)
	FAR 52.233-3	Protest After Award (AUG 1996) and Alternate I (JUN 1985)
	FAR 52.242-1	Notice of Intent to Disallow Costs (APR 1984)
+	FAR 52.242-3	Penalties for Unallowable Costs (MAY 2001)
	FAR 52.242-4	Certification of Final Indirect Costs (JAN 1997)
**	FAR 52.242-13	Bankruptcy (JUL 1995)
	FAR 52.242-15	Stop Work Order (AUG 1989) and Alternate I (APR 1984)
	FAR 52.244-2	Subcontracts (AUG 1998) and Alternate I (AUG 1998) <b>[Insert in cost-reimbursement contracts, and letter, time-and-material, and labor-hour contracts exceeding SAP, and fixed price contracts exceeding SAP where unpriced actions are anticipated. Use Alternate I for cost-reimbursement contracts]</b>
**	FAR 52.244-5	Competition in Subcontracting (DEC 1996)
	FAR 52.244-6	Subcontracts for Commercial Items and Commercial Components (MAY 2004)
	FAR 52.245-5	Government Property (Cost-Reimbursement, Time-and-Materials, or Labor-Hour Contracts) (MAY 2004) and ALT I (JUN 2003) (As modified by DoD Class Deviation 99-00008 dated 13 July 1999) (ALT I is applicable if the contractor is a nonprofit organization whose primary purpose is the conduct of scientific research)
**	FAR 52.247-64	Preference for Privately Owned U.S. Flag Commercial Vessels (APR 2003)
	FAR 52.249-6	Termination (Cost-Reimbursement) (MAY 2004)
	FAR 52.249-14	Excusable Delays (APR 1984)
	FAR 52.251-1	Government Supply Sources (APR 1984)
	FAR 52.253-1	Computer Generated Forms (JAN 1991)

**II. DEPARTMENT OF DEFENSE FAR SUPPLEMENTAL (DFARS) (48 CFR CHAPTER 2) CLAUSES:**

**	DFARS 252.203-7001	Prohibition On Persons Convicted of Fraud or Other Defense-Contract-Related Felonies (MAR 1999)
	DFARS 252.204-7003	Control of Government Work Product (APR 1992)
	DFARS 252.204-7004	Alternate A (NOV 2003)
**	DFARS 252.209-7000	Acquisition from Subcontractors subject to On-Site Inspection under the Intermediate Range Nuclear Forces (INF) Treaty (NOV 1995)
**	DFARS 252.209-7004	Subcontracting with Firms That Are Owned or Controlled by the Government of a Terrorist Country (MAR 1998)
+	DFARS 252.215-7000	Pricing Adjustments (DEC 1991)
++	DFARS 252.219-7003	Small, Small Disadvantaged and Women-owned Small Business Subcontracting Plan (DoD Contracts) (APR 1996)
	DFARS 252.225-7004	REPORTING OF CONTRACT PERFORMANCE OUTSIDE THE UNITED STATES (APR 2003)
**	DFARS 252.225-7012	Preference for Certain Domestic Commodities (FEB 2003)
	DFARS 252.225-7031	Secondary Arab Boycott of Israel (APR 2003)
	DFARS 252.227-7013	Rights in Technical Data – Noncommercial Items (NOV 1995), and Alternate I (JUN 1995)
	DFARS 252.227-7014	Rights In Noncommercial Computer Software and Noncommercial Computer Software Documentation (JUN 1995)
	DFARS 252.227-7016	Rights in Bid or Proposal Information (JUN 1995)
	DFARS 252.227-7019	Validation of Asserted Restrictions – Computer Software (JUN 1995)
	DFARS 252.227-7025	Limitations on the Use or Disclosure of Government-Furnished Information Marked with Restrictive Legends (JUN 1995)
	DFARS 252.227-7028	Technical Data or Computer Software Previously Delivered to the Government (JUN 1995)
	DFARS 252.227-7030	Technical Data – Withholding of Payment (MAR 2000)
	DFARS 252.227-7036	Declaration of Technical Data Conformity (JAN 1997)
	DFARS 252.227-7037	Validation of Restrictive Markings on Technical Data (SEP 1999)
	DFARS 252.231-7000	Supplemental Cost Principles (DEC 1991)
	DFARS 252.232-7003	Electronic Submissions of Payment Requests (MAR 2003)
	DFARS 252.242-7000	Post-Award Conference (DEC 1991)
**	DFARS 252.243-7002	Requests for Equitable Adjustment (MAR 1998)
	DFARS 252.245-7001	Reports of Government Property (MAY 1994)
X	DFARS 252.246-7000	Material Inspection and Receiving Report (MAR 2003)
**	DFARS 252.247-7023	Transportation of Supplies by Sea (MAY 2002)

**	DFARS 252.247-7024	Notification Of Transportation Of Supplies By Sea (MAR 2000) (Applicable when the Contractor has made a negative response to the inquiry in the representation at DFARS 252.247-7022.)
	DFARS 252.251-7000	Ordering from Government Supply Sources (OCT 2002)

**(B) ADDITIONAL FAR AND DFARS CLAUSES**

This contract incorporates one or more clauses by reference as indicated by the mark of (X), with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this address: <http://www.arnet.gov/far/>

	FAR 52.204-2	Security Requirements (AUG 1996) (Applicable if contract will generate or require access to classified information and DD Form 254, Contract Security Classification Specification, is issued to the contractor)
X	FAR 52.209-6	Protecting the Government's Interest when Subcontracting with Contractors Debarred, Suspended, or Proposed for Debarment (JUL 1995) (Applicable to contracts exceeding \$25,000 in value.)
	FAR 52.215-17	Waiver of Facilities Capital Cost of Money (OCT 1997) (Applicable if the Contractor did not propose facilities capital cost of money in the offer)
X	FAR 52.215-21	Requirements for Cost or Pricing Data or Information Other Than Cost or Pricing Data - Modifications (OCT 1997) (Applicable to 'contracts' if cost or pricing data or information other than cost or pricing data will be required for modifications)
	FAR 52.217-9	Option to Extend the Term of the Contract (MAR 2000) (In paragraph (a), insert "0", and in paragraph (c), insert "0") (Applicable if contract contains line item(s) for option(s)) (Complete the spaces in parentheses)
	FAR 52.219-3	Notice of Total HUBZone Set-Aside (JAN 1999)
	FAR 52.219-5	Very Small Business Set-Aside (JUN 2003) (For actions between \$2,500 and \$50,000)
	FAR 52.219-6	Notice of Total Small Business Set-Aside (JUN 2003), and Alternate I (OCT 1995) (Applicable to total small business set-asides, including SBIR) Alternate II (MAR 2004) (As prescribed in 19.508(c))
	FAR 52.219-7	Notice of Partial Small Business Set-Aside (JUN 2003) and Alternate I (OCT 1995) Alternate II (MAR 2004)

	FAR 52.219-10	Incentive Subcontracting Program (OCT 2001) (Applicable at the PCO's discretion to contract actions exceeding \$500,000 and when subcontracting possibilities exist. The clause is small business exempt) (In paragraph (b), insert the appropriate number between 0 and 10 – "XX") (Complete the space in the parentheses)
	FAR 52.219-25	Small Disadvantaged Business Participation Program - Disadvantaged Status and Reporting (OCT 1999) (Applicable if contract includes FAR 52.219-24)
	FAR 52.219-26	Small Disadvantaged Business Participation Program - Incentive Subcontracting Program (OCT 2000) (Applicable at the PCO's discretion to contract actions exceeding \$500,000 and when subcontracting possibilities exist. The clause is small business exempt) (In paragraph (b), insert the appropriate number between 0 and 10 – "XX") (Complete the space in the parentheses)
X	FAR 52.222-20	Walsh Healy Public Contracts Act (DEC 1996) (Applicable if the contract includes deliverable materials, supplies, articles or equipment in an amount that exceeds or may exceed \$10,000)
	FAR 52.223-5	Pollution Prevention and Right-to-Know Information (AUG 2003) (Applicable if contract provides for performance, in whole or in part, on a Federal facility)
X	FAR 52.223-6	Drug-Free Workplace (MAY 2001) (Applies when contract action exceeds \$100,000 or at any value when the contract is awarded to an individual)
	FAR 52.230-2	Cost Accounting Standards (APR 1998) (Applicable when contract amount is over \$500,000, if contractor is subject to full CAS coverage, as set forth in 48 CFR Chapter 99, Subpart 9903.201-2(a) (FAR Appendix B)
X	FAR 52.230-3	Disclosure and Consistency of Cost Accounting Practices (APR 1998) (Applicable when contract amount is over \$500,000 but less than \$25 million, and the offeror certifies it is eligible for and elects to use modified CAS coverage as set forth in 48 CFR Chapter 99, Subpart 9903.201-2 (FAR Appendix B)
X	FAR 52.230-6	Administration of Cost Accounting Standards (NOV 1999) (Applicable if contract is subject to either clause at FAR 52.230-2, FAR 52.230-3 or FAR 52.230-5)
X	FAR 52.232-20	Limitation of Cost (APR 1984) (Applicable only when contract action is fully funded)
X	FAR 52.232-22	Limitation of Funds (APR 1984) (Applicable only when contract action is incrementally funded)

	FAR 52.239-1	Privacy or Security Safeguards (AUG 1996) (Applicable to contracts for information technology which require security of information technology, and/or are for the design, development, or operation of a system of records using commercial information technology services or support services.)
	FAR 52.245-18	Special Test Equipment (FEB 1993) Applicable when it is anticipated that the contractor will acquire or fabricate special test equipment but the exact identification of the equipment is not known)
	DFARS 252.201-7000	Contracting Officer's Representative (DEC 1991) (Applicable when appointment of a Contracting Officer's Representative (COR) is anticipated.)
X	DFARS 252.203-7002	Display of DoD Hotline Poster (DEC 1991) (Applicable only when contract action exceeds \$5 million or when any modification increases contract amount to more than \$5 million)
X	DFARS 252.204-7000	Disclosure of Information (DEC 1991) (Applies when Contractor will have access to or generate unclassified information that may be sensitive and inappropriate for release to the public)
	DFARS 252.204-7005	Oral Attestation of Security Responsibilities (NOV 2001) (Applicable if FAR 52.204-2, Security Requirements Applies)
X	DFARS 252.205-7000	Provision of Information to Cooperative Agreement Holders (DEC 1991) (Applicable only when contract action exceeds \$500,000 or when any modification increases total contract amount to more than \$500,000)
X	DFARS 252.215-7002	Cost Estimating System requirements (Oct 1998) (Applicable only to contract actions awarded on the basis of certified cost or pricing data)
	DFARS 252.223-7004	Drug-Free Work Force (SEP 1988) (Applicable (a) if contract involves access to classified information: or (b) when the Contracting Officer determines that the clause is necessary for reasons of national security or for the purpose of protecting the health or safety of performance of the contract.
	DFARS 252.223-7006	Prohibition on Storage and Disposal of Toxic and Hazardous Materials (APR 1993) (Applicable if work requires, may require, or permits contractor performance on a DoD installation)
	DFARS 252.225-7001	Buy American Act and Balance of Payments Program (APR 2003) (Applicable if the contract includes deliverable supplies) (This clause does not apply if an exception to the Buy American Act or Balance of Payments Program is known or if using the clause at 252.225-7021, or 252.225-7036.)

	DFARS 252.225-7002	Qualifying Country Sources as Subcontractors (APR 2003) (Applicable when clause at DFARS 252.225-7001, 252.227-7021, or 252.227-7036 applies)
	DFARS 252.225-7016	Restriction On Acquisition Of Ball And Roller Bearings (MAY 2004) (Applicable if contract includes deliverable supplies, unless Contracting Officer knows that items being acquired do not contain ball or roller bearings)
	DFARS 252.226-7001	Utilization of Indian Organizations and Indian-Owned Economic Enterprises (OCT 2003) [(Applicable if FAR Part 12 is not used, and for supplies and services (but not R&D) expected to exceed SAP thresholds) (This Final Rule replaces FAR 52.226-1 (JUN 2000) via DFARS Chg Ntc 20020531)]
	DFARS 252.227-7018	Rights in Noncommercial Technical Data and Computer Software – Small Business Innovation Research (SBIR) Program (JUN 1995)
X	DFARS 252.242-7004	Material Management and Accounting System (DEC 2000) (Applicable to contract actions exceeding \$100,000) (Not applicable for contracts awarded to small businesses, educational institutions, or nonprofit organizations)

### (C) COST SHARING – NO FEE RESEARCH AND DEVELOPMENT CLAUSES

The following FAR and DFARS clauses apply to Cost Sharing – No Fee Research and Development Contracts and are either required by regulation or are required when the circumstances of the contract warrant that they apply. The FAR and DFARS clauses for Cost-Sharing Research and Development Contracts only apply when specifically marked with an (X).:

X	FAR 52.216-12	Cost Sharing Contract -- No Fee (APR 1984) [ This clause may be modified by substituting "\$10,000" in lieu of "\$100,000" as the maximum reserve in paragraph (b) if the contract is with a nonprofit organization.] <b>FAR 16.307 (f) (2): Use Alternate I when a cost-sharing research and development contract with an educational institution or a nonprofit organization is contemplated, and if the contracting officer determines that withholding of a portion of allowable costs is not required.</b>
	FAR 52.227-10	Filing of Patent Applications –Classified Subject Matter (APR 1984) (Applicable if contract is subject to FAR clause 52.204-02 and either 52.227-11 or 52.227-12)
	FAR 52.227-11	Patent Rights – Retention by the Contractor (Short Form) (JUN 1997) (Applicable if contractor is a small business or non profit organization)

	FAR 52.243-2	Changes -- Cost-Reimbursement (Aug. 1987) and Alternate V (APR 1984) <b>FAR 43.205 (b)(6): Include clause in research and development contracts with Alternate V.</b>
X	FAR 52.246-9	Inspection of Research and Development (Short Form) (Apr 1984) <b>FAR 46.309: Include in contract when FAR 52.246-7, Inspection of Research and Development -- Fixed-Price; &amp; FAR 52.246-8, Inspection of Research and Development -- Cost-Reimbursement, are not used. FAR 52.246-8 is not applicable when FAR 52.246-9 is used.</b>
	FAR 52.247-63	Preference for U.S.-Flag Air Carriers (JUN 2003) <b>FAR 47.405: Use in contracts whenever it is possible that U.S. Government-financed international air transportation of personnel (and their personal effects) or property will occur in the performance of the contract.</b>
	OR	
X	FAR 52.227-12	Patent Rights -- Retention by the Contractor (Long Form) (JAN 1997) (Applicable if contractor is a large business)
	DFARS 252.227-7034	Patents -- Subcontracts (APR 1984) (Applicable when FAR 52.227-11 applies)
	DFARS 252.227-7039	Patents -- Reporting of Subject Inventions (APR 1990) (Applicable when FAR 52.227-11 applies)
X	DFARS 252.235-7011	Final Scientific Or Technical Report (Sep 1999)

8) Section J, List of Attachments, is hereby revised to add the following paragraphs:

"6. Addendum Number 1, entitled, "3.A. Statement of Work Optional 6 months, Statement of Work Addendum" 3 pages."

"7. EXHIBIT A, ADDENDUM entitled, Contract Data Requirements List" (DD Form 1423) - 2 pages."

"8. Attachment Number 6, entitled, "Financial Accounting Data Sheet 1 page."

9) Paragraph 1, Section K, "Representations, Certifications and Other Statements of Offeror", is hereby revised as follows:

"1. The Contractor's Representations and Certifications, dated 15 JUN 2004, are hereby incorporated into this contract by reference."

10) Both parties agree that any costs incurred for any work not identified and funded under this contract is the sole responsibility of the contractor. The Government will not reimburse the contractor for any costs exceeding the Total Estimated Government Cost Share of \$8,343,896.00.

**ALL OTHER TERMS AND CONDITIONS OF THIS CONTRACT SHALL REMAIN UNCHANGED.**

## **Statement of Work N00014-02-C-0302**

### Background:

High voltage devices (>10.kV blocking) fabricated in SiC require high voltage blocking regions provided by high quality, thick epitaxial layers (e.g. 100 to 200 microns in thickness) exhibiting carrier lifetimes in the several hundred nsec range. A current shortcoming in the technology is the slow epitaxial growth rate which currently makes the production of thick epitaxial layers time-consuming and inefficient. A potential alternative technology is the use of a SiC substrate to provide the effective high-voltage blocking layer. Such an alternative approach, if successful, could lead to a very efficient means of fabricating high voltage power devices in SiC. Unfortunately, current high purity SiC substrates exhibit the problem that the carrier lifetime in the bulk substrate is typically in the range of 20 to 90 nsec which is roughly a factor of three to ten too low to be useful as an effective blocking layer in high power applications. A major question then is; what is the source of the lifetime limitation in bulk SiC substrates compared to thick epitaxial layers?

### Objective:

The overall objective of this feasibility study is to determine the source of the lifetime limitation in bulk SiC substrate material, and to find ways to enhance the bulk lifetime in the substrate. It is also to define the crystal growth and materials parameters that will lead to a significant increase in the carrier lifetime of bulk-grown high purity 4H-SiC crystals and substrates, with the goal of advancing the lifetime from current levels of 20 to 90 nsec into the 100 to 500 nsec range, equivalent to state-of-the-art thick SiC epi.

To accomplish this goal, the contractor proposes a six month focused feasibility program to:

1. Resolve what the limitations are on lifetime in bulk high purity SiC substrates. For example, is the lifetime limit being determined by: residual impurities (e.g. N, B, oxygen, or residual metallics), deep levels (such as point defects or complexes of defects); presence of crystalline structural defects such as dislocations; or is it due to substrate surface effects associated with the surface preparation of the wafers.
2. Determine which growth/processing parameters can be utilized to increase lifetime. (Reduce extrinsic impurities; reduce intrinsic deep levels, etc.).

3. Perform the proper analysis to quantitatively determine bulk carrier lifetime [e.g. photoluminescence decay, microwave photoconductivity decay (PCD), or other] as a function of crystal growth/substrate processing parameters.
4. Verify enhanced carrier lifetime through high voltage device results.

Requirements:

The Contractor shall perform the following Tasks.

**Task 1.** Identify the principal lifetime-killing mechanism in high purity bulk SiC substrates by utilizing materials characterization techniques (such as LTPL, DLTS, SIMS, EPR, time resolved PL-decay, and microwave PCD measurements) to correlate the bulk carrier lifetime in high purity 4H-SiC substrates to crystal growth parameters, crystal stoichiometry (Si/C ratio), and post-growth wafer fabrication and surface preparation steps.

Under this task, the contractor shall augment its internal materials characterization capabilities with the EPR and PL techniques of the materials characterization group at NRL under the direction of Dr. Ben Shanabrook. The contractor will also utilize the expertise of Prof. Ron Gutmann of the Center for Integrated Electronics at Rensselaer Polytechnic Institute to provide quick turn-around microwave photoconductive decay (PCD) measurements and to analyze the PCD response in order to separate out true bulk lifetime effects from the carrier lifetime components due to surface recombination velocity (SRV) effects, and Auger and radiative recombination effects.

**Task 2.** Determine the effect of crystal stoichiometry (Si/C ratio) on intrinsic deep level concentration and the resulting bulk lifetime of 4H-SiC substrates by performing crystal growth as a function of those parameters which affect partial pressures of Si and C molecular species during the bulk sublimation growth process.

**Task 3.** Assess the effect of residual extrinsic impurities (N, B, and oxygen) on bulk carrier lifetime by growing 4H-SiC crystals in alternative ambients such as hydrogen, CH<sub>4</sub>, and CO.

**Task 4.** Determine the effect of post-growth thermal treatment of SiC substrates on the enhancement of bulk carrier lifetime.

**Task 5.** Determine the effect of substrate surface treatments such as KOH and reactive ion etching, chemi-mechanical polish treatments, and oxidation on the enhancement of bulk carrier lifetime.

**Task 6.** Assess enhancement in carrier lifetime of 4H-SiC substrates by fabricating test batches of high voltage blocking devices utilizing the substrate as the blocking layer.

Deliverables:

The contractor shall provide three wafers of 4H-SiC representative of the enhanced carrier lifetime achieved at the end of the program.

The contractor shall provide interim reports on a quarterly basis and a final report summarizing the findings of this feasibility study.

CONTRACT DATA REQUIREMENTS LIST (1 Data Item)						Form Approved OMB No. 0704-0188	
The public reporting burden for this collection of information is estimated to average 110 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0701-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to the above address. Send completed form to the Government Issuing Contracting Officer for the Contract/PR No. listed in Block E.							
A. CONTRACT LINE ITEM NO. 0009		B. EXHIBIT A		C. CATEGORY TDP <input type="checkbox"/> TM <input type="checkbox"/> OTHER <input checked="" type="checkbox"/> R&D			
D. SYSTEM/ITEM		E. CONTRACT/PR NO. N0001402C0302		F. CONTRACTOR CREE INC.			
1. DATA ITEM NO.  A001		2. TITLE OF DATA ITEM  Quartry Progress Report		3. SUBTITLE			
4. AUTHORITY (Data Acquisition Document No.) CONTRACTOR FORMAT		5. CONTRACT REFERENCE SOW 7.1		6. REQUIRING OFFICE ONR 312			
7. DD 250 REQ LT	9. DIST STATEMENT REQUIRED  C	10. FREQUENCY QUARTERLY	12. DATE OF FIRST SUBMISSION SEE BLK 16	14. DISTRIBUTION			
8. APP CODE		11. AS OF DATE	13. DATE OF SUBSEQUENT SUBMISSION SEE BLK 16	a. ADDRESSEE	b. COPIES		
					Draft	FINAL	
						Reg	Repro
16. REMARKS  BLK 12/13: FIRST REPORT DUE NO LESS THAN 30 DAYS AFTER CONTRACT AWARD.  INCLUDE AS A MINIMUM: TECHNICAL PROGRESS AND STATUS; MONTHLY FISCAL EXPENDITURES VERSUS THE CONTRACT'S EXPENDITURE PLAN; ISSUES AND PROPOSED SOLUTIONS.  BLK 14: SUBMISSION SHALL BE BY ELECTRONIC MAIL TO THE ONR PROGRAM OFFICER IN A FORMAT THAT IS COMPATIBLE WITH MICROSOFT® OFFICE 2000 AND/OR MICROSOFT® PROJECT.  NOTE: Acceptance of any progress report which includes information concerning changes in contract requirements/standards/specifications does not constitute Government agreement to those changes. Only by direction of the Contracting Officer can such changes be made.				SEE ENCLOSURE (1)		1	
G. PREPARED BY C WAGONER, ONR CODE 251		H. DATE		I. APPROVED BY		J. DATE	



# FINANCIAL ACCOUNTING DATA SHEET - NAVY

1. CONTRACT NUMBER (CRITICAL) N0001402C0302		2. SPIN (CRITICAL) P00006		3. MOD (CRITICAL) P00006		4. PR NUMBER 04PR04936-02		PAGE 1 OF 1	
6. LINE OF ACCOUNTING									
CLIN	ACRN	APPROPRIATION	SUBHEAD	OBJ	PARM	F	G	H	I
AC	9740400	1304	255	2A	313	0	068342	2D	000000
7.									
AMOUNT (CRITICAL)									
\$799,639.00									
PR#04PR04936-02 FRC:A110									
NAVY INTERNAL USE ONLY REF DOC/ACRN									
PAGE TOTAL \$799,639.00									
GRAND TOTAL \$799,639.00									
PREPARED AUTHORIZED BY: [REDACTED]									
DATE: 6/30/04									
COMPTROLLER, ONR CONTRACT REVIEWED									

## Contract Distribution Sheet

PR Number: 04PR04936-02  
Contract Number: N00014-02-C-0302-/P00006  
Specialist: CLW ONR: 251

Distribution Date: **JUN 30 2004**

Distributed By: **(b) (6)**

— PCO, ONR Arlington (Original)

— Contractor (Duplicate Original)  
Short Contractor Code and Address:  
CREE  
CREE INC  
4600 SILICON DRIVE  
DURHAM, NC 27703

— ACO  
ACO MILSCAP Code & Address S5111A:  
DCMA SOUTHERN VIRGINIA  
190 BERNARD ROAD  
FORT MONROE, VA 23651

— Payment Office  
DODAAD Code and Address HQ0338:  
DFAS COLUMBUS CENTER DFAS CO SOUTH ENTITLEMENT OPERATIONS  
PO BOX 182264  
COLUMBUS, OH 43218-2264

— ONR:  
00CC11  
Program Officer: Harry Dietrich, ONR 312